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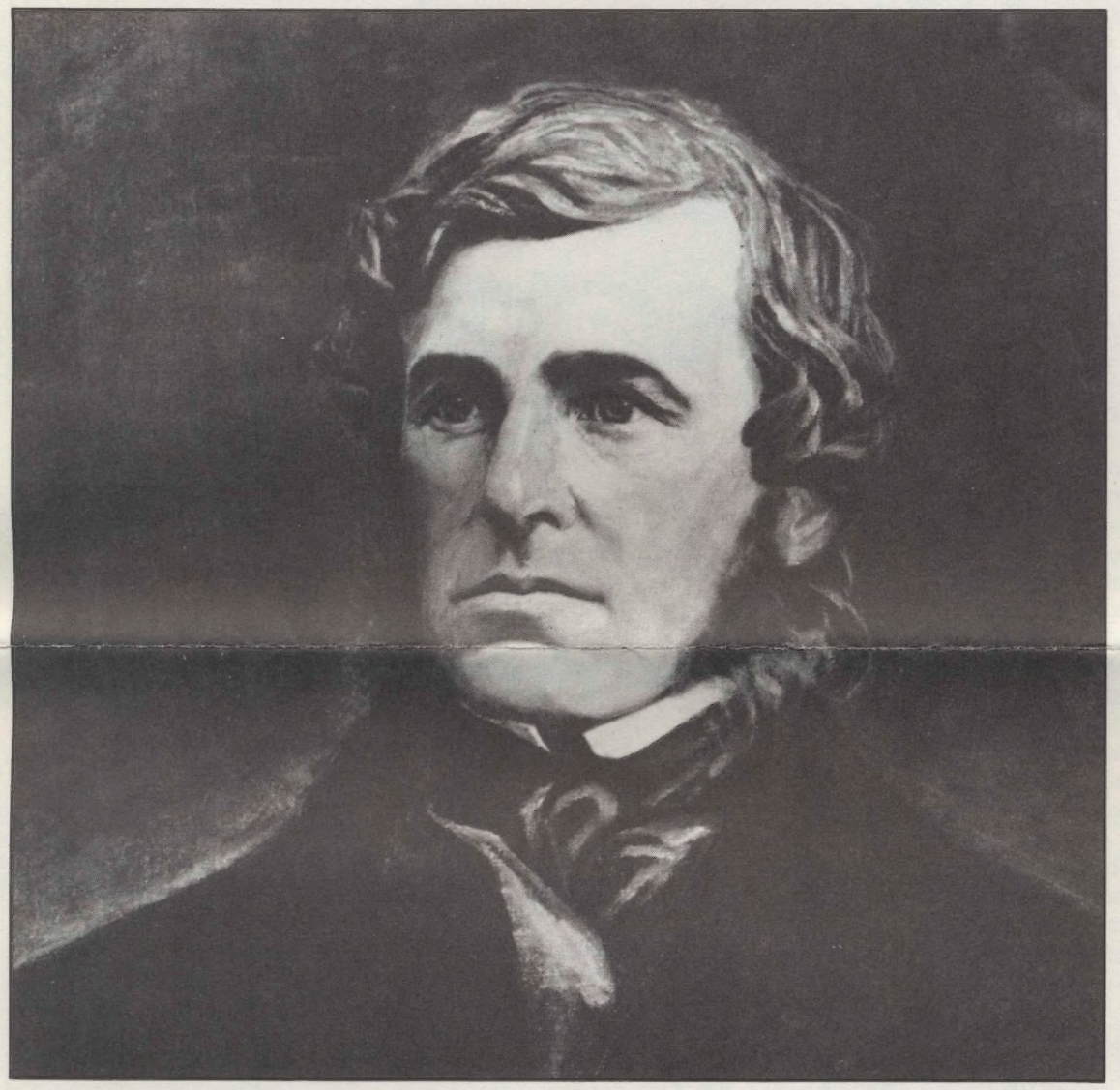
BIOME

A publication of the National Museum of Natural Sciences

Vol. 6:1 1986 ISSN 0712-9319

Glimpses of the Past: Elkanah Billings (1820-1876)



Elkanah Billings, the son of an Ottawa pioneer family and the first paleontologist to join the Geological Survey of Canada, earned this organization an international reputation in the field of invertebrate paleontology. Beginning with his first assignment of organizing the Survey's fossils for public display, he also helped to lay the foundation for the original National Museum of Canada, from which the National Museum of Natural Sciences grew.

True to his era of the "professional amateur," Billings began his study of paleontology through his hobby of exploring the rocks and riverbanks of what is now Canada's capital. By the time he joined the Geological Survey in 1856, the future world-renowned paleontologist had already had three careers.

Billings started out as a lawyer, but interest in his practice waned and in 1852 he became editor of the *Bytown Citizen*, forerunner of today's *The Citizen*. When not accusing the editor of the rival *Bytown Gazette* of writing "gibberish," Billings produced columns on scientific developments, from anatomy to inventions. He also followed the progress of the Geological Survey, headed by William E. Logan, and wrote articles to explain its findings.

Billings left the newspaper to run and, on the whole, to write, his own magazine, *The Canadian Naturalist and Geologist*. Designed to popularize natural history, the magazine's premier issue carried paleontological articles of such excellence that it led to its editor's appointment to the Geological Survey of Canada.

During the course of this, his final career, Billings described over 1000 new species of fossil invertebrates and identified an even greater number that had previously been described but never before found in Canada. His work was invaluable in dating the earth's geological layers and, during a particularly mystifying Survey expedition into Quebec, his observations led to one of the earliest published theories about discrepancies in the sequence of these layers.

Evidence of the high esteem in which Billings was held in the scientific circles of his day and since remains in the many genera and species named after him by North American and European paleontologists. His findings on the basis of fossil evidence helped to establish the calendar of earth history fundamental to modern geology.

Carol Atwell Kinley

Cranes

Cranes are large wading birds that live in marshes, savannas, plains and other similar habitats. They are found on every continent except South America, home to related but smaller, primarily forest-dwelling birds, the limpkins and the trumpeters. The ancestors of today's cranes can be traced back to a now-extinct family of birds, the Geranoididae, which lived in North America some 50 million years ago. Cranes are thus a part of a very ancient group, and most known species have been identified only from the fossil record. There are currently 14 living species, several of which are endangered, with extremely small populations.

Fossils show that the first true cranes (Gruidae) lived in Europe during the Eocene, approximately 45 million years ago. These ancestral cranes, which colonized North America and replaced the Geranoididae, belonged to the crowned crane group, of which only one species remains in existence today, the Crowned Crane (*Balearica pavonina*) of tropical Africa. Ten million years ago, when crowned cranes still populated North America, they lived in an environment not unlike that inhabited by the surviving species: savannas frequented by elephants, rhinoceros and other hoofed animals.

The other group of cranes, to which all contemporary species except the Crowned Crane belong, is chiefly characterized by a more highly developed vocal apparatus. This group is thought to have appeared approximately ten million years ago, colonizing the Northern Hemisphere, Africa and Australasia. During the Ice Age, lower sea levels and a drier climate created large, savanna-covered islands in the Caribbean region. A type of flightless crane (*Baeopteryx*), otherwise quite closely related to current species, lived on these islands during that period.

Two species of cranes live in North America today: the Sandhill Crane (*Grus canadensis*) and the Whooping Crane (*Grus americana*). A third species, the Common Crane (*Grus grus*), is native to Europe and Asia, mostly in the northern areas, but has been observed in North America on a very limited number of occasions. The Sandhill Crane, a relatively small species with slaty coloration, feeds mainly on grain and vegetable matter. The Whooping Crane, larger with black-and-white plumage, lives mainly in aquatic environments and its diet seems to be composed primarily of invertebrates and other small animals. Given this difference in diets, the two species can easily co-exist.

In the pre-Columbian era, the Sandhill Crane nested in suitable habitats throughout North America. Northern representatives of the species, smaller and more migratory than those of other populations, inhabited the tundra and adjacent taiga; larger, less migratory birds ranged in the Prairies and the marshes of the Pacific Coast, and darker, primarily sedentary ones lived in marshes of the southern United States and the wooded swamps of Cuba. Most of these populations have been greatly reduced, however, and only those that nest in the tundra are relatively plentiful today, despite being hunted as game birds.

Some of these cranes make an annual migration across the Bering Strait to nest in the Siberian tundra. Occasionally, a stray Common Crane joins them in Siberia and then follows them along the migratory flypath, which takes them back to the central and southern regions of North America. Similarly, Sandhill Cranes have strayed and been observed as far away as Japan and Ireland.

At one time, the Whooping Crane also had a fairly extensive distribution. Bones from this species have been found both in California and in Florida, and reports from colonial times mention its presence on the eastern coast of the United States. Despite a breeding range that stretched from the Northwest Territories to the Gulf of Mexico, no differences have been reported between the various populations, as with the Sandhill Crane.

The Whooping Crane is perilously close to extinction. In 1954, there were only 21 cranes remaining in the wild, summering at Wood Buffalo National Park, which straddles the Alberta-Northwest Territories border; and wintering in the Aransas National Wildlife Refuge in coastal Texas. However, special protection and management measures increased this number to 100 by 1985. A second wild population of 41 birds has recently been artificially created in Idaho by transplanting eggs into the nests of Sandhill Cranes, but the successful establishment of this new population, which winters in New Mexico with the adoptive parents, remains to be determined.

Michel Gosselin
Vertebrate Zoology Division

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EDITORIAL

What Would You Do?

I was asked the other day what subjects our museum covered. I replied: "Everything in the natural universe." There was a startled look. "Everything?" was the incredulous reply. Perhaps too hastily I rejoined: "Yes. Everything! From the molecules to the stars, from the primordial slime to the biology of humankind." And then I reflected: "Except what has actually been altered by man such as in the production of art or buildings or technology. But certainly that is a tiny fraction of the universe." Our museum is one of the world's important repositories of both information and artifacts on which mankind's view of the natural world is based.

It is an enormous task, to be responsible for almost everything. How can you find enough talented people, how do you organize them, who will be the experts on all the different kinds of plants, or on animals from single-celled to whales, from creepy to furry, and who will distinguish the gems from the rubble? Do you remember the game called 'Animal, Vegetable or Mineral?' We have chosen to organize the Museum in the same way. We have chosen very large groupings of organisms or minerals as the method of dividing up the job. From the research discoveries that we make, and from those of others, we use an incredible variety of means to tell everyone else about the marvels of our universe. Exhibits, lectures, films, plays and television programs are all used to entice an interest in what we are and where we came from.

Suppose you were asked what is the least important thing your museum does. What would you say? Suppose someone said to you: "You must fire 15% of the museum staff." What would you give up doing? Not an easy question. Do you stop doing the research? No! Because then you would have no experts, and eventually, all of your information would be old and useless. Do you stop keeping a collection? No! That's what a museum is. Do you stop having exhibits? Stop publishing books? Having plays? School programs? No! No! No! No!

These are questions I may have to answer soon. What would **you** do if you were Director of the National Museum of Natural Sciences?

Alan R. Emery
Director

Amphipod Expert Wins Public Service Award

Dr. Edward Bousfield never thought that his passion for little shrimps and sandhoppers would win him a high profile award. But it did.

Last June, the Senior Scientist and specialist of invertebrate zoology of the NMNS was presented with the Public Service of Canada's Outstanding Achievement Award for his contributions to science.

"I was flabbergasted and flattered when told I was an award winner. It's rather remarkable, because generally 'high-profile' people receive this award. I still don't know why I was picked, but if they made a mistake, I'm not giving it back," said the friendly scientist who is affectionately known as "Dr. B" by staff.

"I just hope whatever I do helps the Museum get the recognition it deserves," he added.

Established in 1966, the award is presented to public employees who have increased the prestige of the Public Service of Canada. All government department heads are canvassed for candidates and the nominees are reviewed by a committee appointed by the Prime Minister.

Through 35 years of dedicated work with the Museum, Dr. B has almost single-handedly built the 350,000-specimen amphipod collection to its present world status. Almost 100 technical and non-technical publications have resulted from his efforts to promote these little-known animals.

Amphipods are small crustaceans that range from a millimeter in length to lobster size. They live in all permanent water bodies and are basic items in the aquatic food energy cycle, from algae to fishes, and ultimately humans. Dr. B's interest in these creatures began when he was searching for a thesis topic to finish off his Master of Science degree at the University of Toronto.

"A professor of mine, the late A.G. Huntsmen, brought me over to his 'glory hole' of unworked collections from Canadian marine expeditions and said, 'what tickles your fancy Ed?'. I picked the amphipods (of the Belle Isle Strait eastern Canada)."

And he's never looked back.

After completing his Master's degree in Toronto, Dr. B joined the staff at the National Museum in 1950 as an invertebrate zoologist. He took partial educational leave to complete his Ph.D at Harvard in 1954; he became Chief Zoologist in 1964 and Senior Scientist in 1974, a position he loves because he can put most of his energy into research. Especially satisfying is the thought that many of the 45 graduate students he has supervised to M.Sc and Ph.D degrees during his career are still working on amphipods.

Dr. B's main goal is to recreate the most accurate phylogeny (family tree) of amphipods: to find out how various amphipod species and groups are related to each other, and how they are related to other crustaceans.

But with 6000 known species and a possible 25,000 in existence, the scientist's task is not a simple one. "I call it sorting sheep from goats. It's very difficult because there are very few fossil records, and to the layman amphipods all seem to look alike."

Convinced that he has found a methodology that will help him "classify the critters," Dr. B recently presented a paper at society meetings in France entitled "Ordered Character States as a Basis for Phyletic Classification Within the Amphipoda." He hopes that knowledgeable colleagues in his field will approve of his answer, but some of them have different and strongly held views of their own!

Dr. B has written several articles and books on the subject of amphipods, mostly Canadian and North American species. He hopes to complete an illustrated guide book for the public entitled "Amphipods Made Easy," so they will learn more about these fast-swimming "crust-less" (shell-less) crustaceans.

"A hundred years ago, dinosaurs were a new thing. Today, you hear five-year-olds referring to *Tyrannosaurus rex*. Some day, I'd like to hear five-year-olds talk about amphipods in the same way," he said wistfully.

Aside from analyzing these challenging creatures, the doctor likes to spend time playing "oldies" on his electric guitar, and finding time for table tennis, lawn bowling and curling.

His Public Service Award follows the "Sars Golden Amphipod Award" given to him by Museum staff in 1980. It depicts an amphipod with a curling stone in its mouthparts, and is probably one of the few awards in existence that has been given for combined athletic and scientific excellence!

Dr. B is thinking of retiring in a few years, but he knows that he can't leave his crustaceans alone. He hopes to stay on at the NMNS, and at the Royal Ontario Museum in Toronto, in a research capacity. Among many other projects, he wants to pursue a study of South Pacific amphipods, understandably during January to March of each year!

"I've got 50 years of retirement ahead of me," he joked.

Kim Carter

John Evans Photo Ltd.

Her Excellency, Madame Jeanne Sauvé, Governor General of Canada, presents the Public Service of Canada's Outstanding Achievement Award to Dr. Edward L. Bousfield at Government House, Ottawa, June 26, 1985.

BIOME

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Acknowledgements:
Michelle Dondo-Tardiff
Bonnie Livingstone
Annie J. Ollivier
Louise L. Trahan
Linda Travers-Bois

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Graphic Design:
Acart Graphic Services, Inc.

Illustrations:
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Cette publication est également offerte en français

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ERRATUM

Please note that "Birds, Birds, Birds" will open on March 10 rather than February 8. Also, the "Bird Houses" demonstrations of March 23 have been cancelled.

Prière de noter que "Des oiseaux partout" sera présenté au public à compter du 10 mars plutôt que du 8 février. De même, les démonstrations de fabrication de nichoirs d'oiseaux du 23 mars ont été annulées.

PROGRAMS AND ACTIVITIES

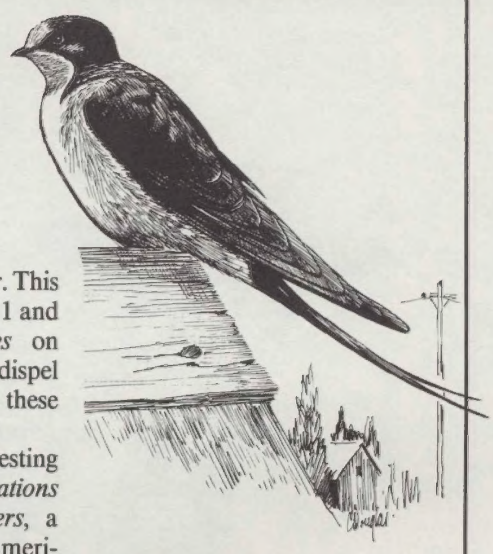
At the National Museum of Natural Sciences

February/April 1986

For Our Feathered Friends

The Museum's Spring 1986 activities continue to focus on birds.

Ruby-throated Hummingbird



Barn Swallow

Bird Feeders, *Bird Houses* and *Birds, Birds, Birds* are the three displays featured in the Temporary Exhibits Gallery (3rd floor east) this Spring. Visitors to *Bird Feeders*, which is on view until March 16 and includes continuous projections of **bird videos**, are invited to participate in our **workshops** and learn to make feeders for our feathered friends. Bring a well-washed milk carton, plastic detergent or bleach bottle. This display and *Bird Houses*, which opens on March 22, are also accompanied by **demonstrations** in which Museum cabinet makers will build wooden bird feeders and houses — lucky participants may win one!

If you don't know your warblers or can't tell a wren from a sparrow, then come to *Birds, Birds, Birds* beginning February 8 and learn the first steps in identifying these fascinating creatures. There will be colourful specimens, felt "puzzles" for the very young, and computer quizzes for every birdwatcher — novice or expert. Bird and music enthusiasts of all ages can also attend *Ian Tamblyn on Stage* in the Auditorium (1st floor), a musical performance by a well-known Canadian folk singer who has composed music incorporating recorded bird songs especially for this event.

Other activities this Spring include *Life on Earth: Fact/Fiction*, sponsored in co-operation with the Ottawa Film Society. This Sunday series of **feature-length films** shown in the Auditorium, such as *Moby Dick*, combines Hollywood's view of the animal world with a look at real life. Before each film, Museum staff will give a short talk about some of the animals to appear on screen that day. Specimens will be available for you to handle and study, and the specialist will hold a question period after the screening. *Moby Dick* features Dr. Steve Cumbaa of the Museum's Zooarcheological Identification Centre as guest speaker. Prior to the programme, you might wish to view *Red Bay* in the Foyer (1st floor), a display illustrating the Centre's work at the site of a 16th-century shipwreck and whaling station at Red Bay, Labrador. This Foyer display ends on April 1 and will be followed by *Leeches* on April 5; we hope that it will dispel many of the myths about these blood-sucking invertebrates!

Watch for two other interesting displays. *Museum Publications Competition Award Winners*, a showcase circulated by the American Association of Museums that includes a poster designed by Ole Neilson of the NMNS, is on view until February 23 in the Mezzanine (2nd floor). And on March 15 and 16, the Salon (3rd floor) will feature *Ikebana*, a display of the traditional Japanese art of flower arranging by the members of Ikebana International, Chapter 120, that will be accompanied by **demonstrations** in the Auditorium. *Music at the Museum* will also be presented in the Salon, a series of Sunday **evening concerts** made possible through the collaborative efforts of Marks and Spencer, The Music Performance Trust Fund, The Ottawa-Hull District Federation of Musicians, Radio-Canada and the Museum.

We hope that you will enjoy our Spring events; many more activities to help you celebrate the wonder of our feathered friends and the science of ornithology are being planned to coincide with the **19th International Ornithological Congress**, which will be held in Ottawa this June. Be sure to keep in touch!

Our doors are open six days a week, from 10 a.m. to 5 p.m. Closed Mondays, except on public holidays. Beginning May 1, they are open daily, from 10 a.m. to 5 p.m. Please note that the Museum will open at 7 p.m. to allow access to music performances.

C A L E N D A R • O F • E V E N T S

FEBRUARY

S	M	T	W	T	F	S
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2	3	4	5	6	7	(8)
9	10	11	12	13	14	(15)
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MARCH

S	M	T	W	T	F	S
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APRIL

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20	21	22	23	24	25	26
27	28	29	30			

FEBRUARY

continuing display
Bird Feeders

continuing display
Red Bay

continuing display
Museum Publications Competition Award Winners

8
opening of display
Birds, Birds, Birds

15 & 16 1 p.m. to 4:30 p.m.
Bird Feeders
bilingual workshops

16 1 p.m. to 4:30 p.m.
Bird Feeders
bilingual demonstrations

16 1:30 p.m.
The African Queen
Life on Earth film
in English

16 7:30 p.m.
Music at the Museum
Music for Two Violins

19 8:00 p.m.
Ian Tamblyn on Stage

23
end of display
Museum Publications Competition Award Winners

MARCH

1 & 2 1 p.m. to 4:30 p.m.
Bird Feeders
bilingual workshops

2 1 p.m. to 4:30 p.m.
Bird Feeders
bilingual demonstrations

2 1:30 p.m.
Moby Dick
Life on Earth film in French

2 7:30 p.m.
Music at the Museum
Ottawa Baroque Ensemble

15 & 16
Ikebana Display

15 1:30 p.m. to 2:30 p.m.
Ikebana
bilingual demonstration

16 11 a.m. to Noon
Ikebana
bilingual demonstration

16
end of display
Bird Feeders

16 1:30 p.m.
Moby Dick
Life on Earth film
in English

16 7:30 p.m.
Music at the Museum
Music of the
Twentieth Century

22
opening of display
Bird Houses

23 1 p.m. to 4:30 p.m.
Bird Houses
bilingual demonstrations

APRIL

1
end of display
Red Bay

5
opening of display
Leeches

6 7:30 p.m.
Music at the Museum
Music of the
Eighteenth Century

Corner of Metcalfe and McLeod Streets

National Museums of Canada
Musées nationaux du Canada
Canada

PROGRAMMES ET ACTIVITÉS

au Musée national des sciences naturelles

De février à avril 1986

Colibri à gorge rubis

Nos amis, les oiseaux

Au printemps, les expositions et programmes du Musée continueront de mettre l'accent sur les oiseaux, thème de l'année 1986.

Hirondelle des granges

À la Galerie des expositions temporaires (3e étage, côté est), on pourra voir l'exposition «Paysage d'hiver», avec projection continue de **bandes vidéo** ainsi que «Les maisonnettes d'oiseaux» et «Des oiseaux partout», un laboratoire ornithologique ambulant. Les visiteurs de l'exposition «Paysage d'hiver», présentée jusqu'au 16 mars, sont invités à participer à des **ateliers** où ils pourront apprendre à fabriquer des mangeoires d'oiseaux. Prière d'apporter un contenant de lait en carton ou une bouteille de plastique (à détergent ou à eau de javel) bien propre. À cette exposition, ainsi qu'à «Les maisonnettes d'oiseaux», qui commence le 22 mars, se greffent des **démonstrations** au cours desquelles des menuisiers du Musée construisent des mangeoires et des maisonnettes d'oiseaux en bois que vous pouvez gagner en participant à un tirage hebdomadaire.

Si vous ne vous y retrouvez pas dans la famille des parulines, si vous confondez troglodytes et pinsons, consultez dès le 8 février «Des oiseaux partout», un laboratoire ambulant éducatif et amusant qui vous initiera à l'abc de l'identification de ces fascinantes créatures. On pourra admirer des spécimens aux vives couleurs, et il y aura des «casse-tête» en feutre pour les tout-petits, ainsi que des jeux questionnaires informatisés à la mesure des connaissances de chacun. Les amis des oiseaux, jeunes et moins jeunes, sont aussi invités à assister au spectacle de **Ian Tamblyn** à l'auditorium (rez-de-chaussée). Pour l'occasion, ce chansonnier canadien bien connu a intégré à ses compositions des enregistrements de chants d'oiseaux.

Entre autres activités qui se poursuivent au printemps, mentionnons *La Terre et la vie — fiction et réalité*, présentée à l'auditorium en collaboration avec le Ciné-club d'Ottawa. Cette série dominicale de **longs métrages** comporte des films comme *Moby Dick* et nous offre une vue hollywoodienne du monde animal conjuguée à l'observation de la vie réelle. Avant chaque projection, un scientifique nous renseigne sur l'univers naturel montré à l'écran ce jour-là. On peut manipuler et étudier certains spécimens sur place, et le spécialiste répond aux questions de l'auditoire après la séance. À la projection de *Moby Dick*, le conférencier invité est Steve Cumbaa, chef du Centre d'identification zooarchéologique du Musée. Avant le début de la séance, peut-être voudrez-vous voir, au rez-de-chaussée, l'exposition «Red Bay», qui illustre les travaux du Centre sur le site d'une épave du XVIe siècle et d'un poste de chasse à la baleine à Red Bay (Labrador). Cette exposition se termine le 1er avril. Elle sera remplacée, à partir du 5 avril, par «Les sangsues»; espérons que les visiteurs y perdront certains de leurs préjugés à l'endroit de ces invertébrés qui se nourrissent de sang!

Nous présenterons en outre deux autres expositions intéressantes. «Museum Publications Competition Award Winners», une exposition mise en circulation par l'American Association of Museums, qui comprend une affiche créée par Ole Neilson du Musée national des sciences naturelles, est ouverte au public jusqu'au 23 février à la mezzanine (2e étage). Les 15 et 16 mars, on pourra admirer «Ikebana» au Salon (3e étage), une exposition d'art floral traditionnel japonais organisée par les membres d'Ikebana International, section 120, qui sera agrémentée de **démonstrations** à l'auditorium. *La musique au Musée* aura lieu au Salon; cette série de **concerts** dominicaux de soirée est rendue possible grâce aux efforts conjugués de Marks and Spencer, des Fonds de financement pour les événements musicaux, de la Fédération des musiciens du District de l'Outaouais, de Radio-Canada et du Musée national des sciences naturelles.

Nous espérons que notre programme printanier saura vous plaire; nous comptons en outre faire coïncider avec le XIXe **Congrès ornithologique international**, qui se tiendra à Ottawa du 22 au 29 juin, de nombreuses activités qui permettront au public de célébrer dignement la beauté des oiseaux et la science des ornithologues. Renseignez-vous!

Le Musée national des sciences naturelles est ouvert six jours par semaine, de 10 h à 17 h. Fermé le lundi, sauf les jours fériés. À partir du 1er mai, nous ouvrirons quotidiennement de 10 h à 17 h. Veuillez noter que le Musée ouvre ses portes à 19 h les soirs de concert.

CALENDRIER • DES • ÉVÉNEMENTS

FÉVRIER

D	L	M	M	J	V	S
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(23)	24	25	26	27	28	

MARS

D	L	M	M	J	V	S
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9	10	11	12	13	14	(15)
(16)	17	18	19	20	21	(22)
(23)	24	25	26	27	28	29
30	31					

AVRIL

D	L	M	M	J	V	S
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(6)	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

FÉVRIER

exposition en cours
«Paysage d'hiver»

exposition en cours
«Red Bay»

exposition en cours
«Museum Publications Competition Award Winners»

8
ouverture du laboratoire «Des oiseaux partout»

15 et 16 13 h à 16 h 30
Les mangeoires d'oiseaux
ateliers bilingues

16 13 h à 16 h 30
Les mangeoires d'oiseaux
démonstrations bilingues

16 13 h 30
The African Queen
Film de la série
La Terre et la vie en anglais

16 19 h 30
La musique au Musée
Musique pour deux violons

19 20 h
Ian Tamblyn en spectacle

23
fin de l'exposition «Museum Publications Competition Award Winners»

MARS

1 et 2 13 h à 16 h 30
Les mangeoires d'oiseaux
ateliers bilingues

2 13 h à 16 h 30
Les mangeoires d'oiseaux
démonstrations bilingues

2 13 h 30
Moby Dick
film de la série
La Terre et la vie en français

2 19 h 30
La musique au Musée
L'ensemble baroque d'Ottawa

15 et 16
exposition d'art floral japonais «Ikebana»

15 13 h 30 à 14 h 30
Ikebana
démonstration bilingue

16 11 h à 12 h
Ikebana
démonstration bilingue

16
fin de l'exposition «Paysage d'hiver»

16 13 h 30
Moby Dick
film de la série
La Terre et la vie en anglais

16 19 h 30
La musique au Musée
Musique du XXe siècle

22
ouverture de l'exposition «Les maisonnettes d'oiseaux»

23 13 h à 16 h 30
Les maisonnettes d'oiseaux
démonstrations bilingues

AVRIL

1
fin de l'exposition «Red Bay»

5
ouverture de l'exposition «Les sangsues»

6 19 h 30
La musique au Musée
Musique du XVIIIe siècle

Angle des rues Metcalfe et McLeod

Musées nationaux du Canada
National Museums of Canada

Canada

Sherlock Bones?

The year was 1624. Samuel de Champlain and his men were building a new warehouse for his Habitation in Québec. The sun was setting and Champlain started to feel the chill of the crisp autumn air as his men stopped their work to head home for a good hot meal. As he walked, he noted with satisfaction that the Recollet priests' stock of domestic animals had increased — they now had geese, ducks, and a variety of chickens in addition to cattle, sheep, and pigs in the enclosure close by their living quarters. As he came near the shed where feed was kept, a rat quickly scurried across the street, pursued by the priests' cat. Champlain smiled, and shook his head in wonder at how quickly the rat population had built up after the establishment of Québec only a few years before. The warmth of the kitchen fire and the wonderful smell of roast goose greeted him as he opened the door; fortunately the hunters had been successful the day before at Cap Tourmente with the Snow Geese. One of the cooks was plucking a Green-winged Teal, and the other was slicing venison from a large roast. Things were going well for the fledgling colony. He grinned, picked up a bone from the platter, and tossed it outside to the mongrel dog which had followed him from the warehouse.

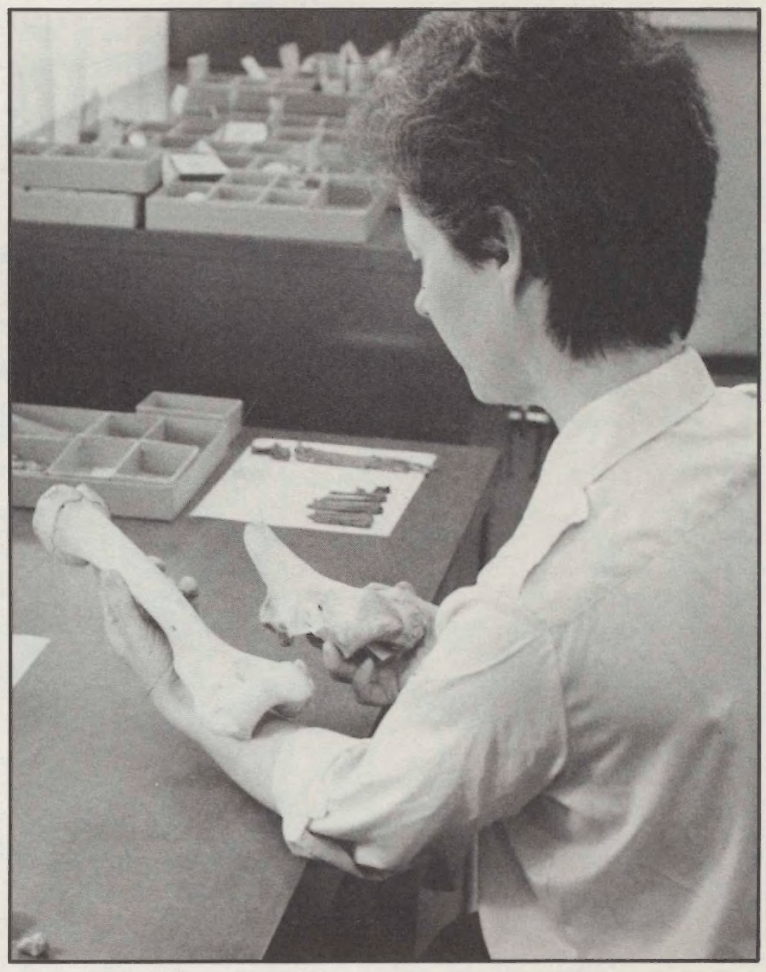
This is a story, an interpretive account based on facts, which the staff of the Museum's Zooarchaeological Identification Centre pieced together from clues found a few years ago during the excavation of the remains of Champlain's Habitation in Place Royale in Québec. It is a story built up from historical documents such as Champlain's own journal, the archaeological evidence, and clues we have uncovered from a detailed examination of the animal bones

*ZIC staff have identified hundreds of Passenger Pigeon (**Ectopistes migratorius**) bones from archaeological sites in Canada and the northern United States. The last known Passenger Pigeon died in a zoo in 1914.*

found associated with Champlain's living quarters. This detective work is the sort of thing our staff does on a daily basis. The bones of each animal species are unique and often distinctive. This fact allows us, with access to a large comparative skeletal collection, to identify individual bones found in the excavation. Knowing the seasonal migration patterns of birds and other animals helps us pin down a particular time of year, cut marks on the bones show us how an animal was prepared for cooking, the size of the bones tells us something about the type of meals served — steaks or pot roasts, for example — and evidence of burning can tell us about particular cooking techniques. Tooth marks on bones tell us if a dog, cat, or rat chewed on the bones, and a lot of rat gnawing indicates both that a number of rats were present and that garbage was not routinely buried or burned — an interesting way to learn about sanitary conditions in our early Canadian cities! From Champlain's Habitation we recorded use of 64 animal species, an amazing degree of dietary diversity.

Since its establishment in 1972, the ZIC has used the techniques of Sherlock Holmes and television's Quincy to investigate and report on nearly 100 archaeological sites. In addition, an increasing number of our studies are biological projects, often involving predator feeding studies. Research projects involve such diverse topics as the comparative osteology of cattle and bison, seasonal dating techniques, and archaeological evidence of the cod fishery in Atlantic Canada. To date, we have completed service projects for over 50 institutions in Canada and the United States — and the number is increasing each year. Sometime next year we will identify our millionth bone!

The ZIC has been asked to do these projects because it is a unique resource. The strength of this unit of the Museum is in its staff and its



*Darlene Balkwill compares the humerus (upper arm bone) of a young polar bear (**Ursus maritimus**) from ZIC's extensive reference collection with a much larger fragment on the right which was recovered from underwater deposits at a 16th century Basque whaling station at Red Bay, Labrador.*

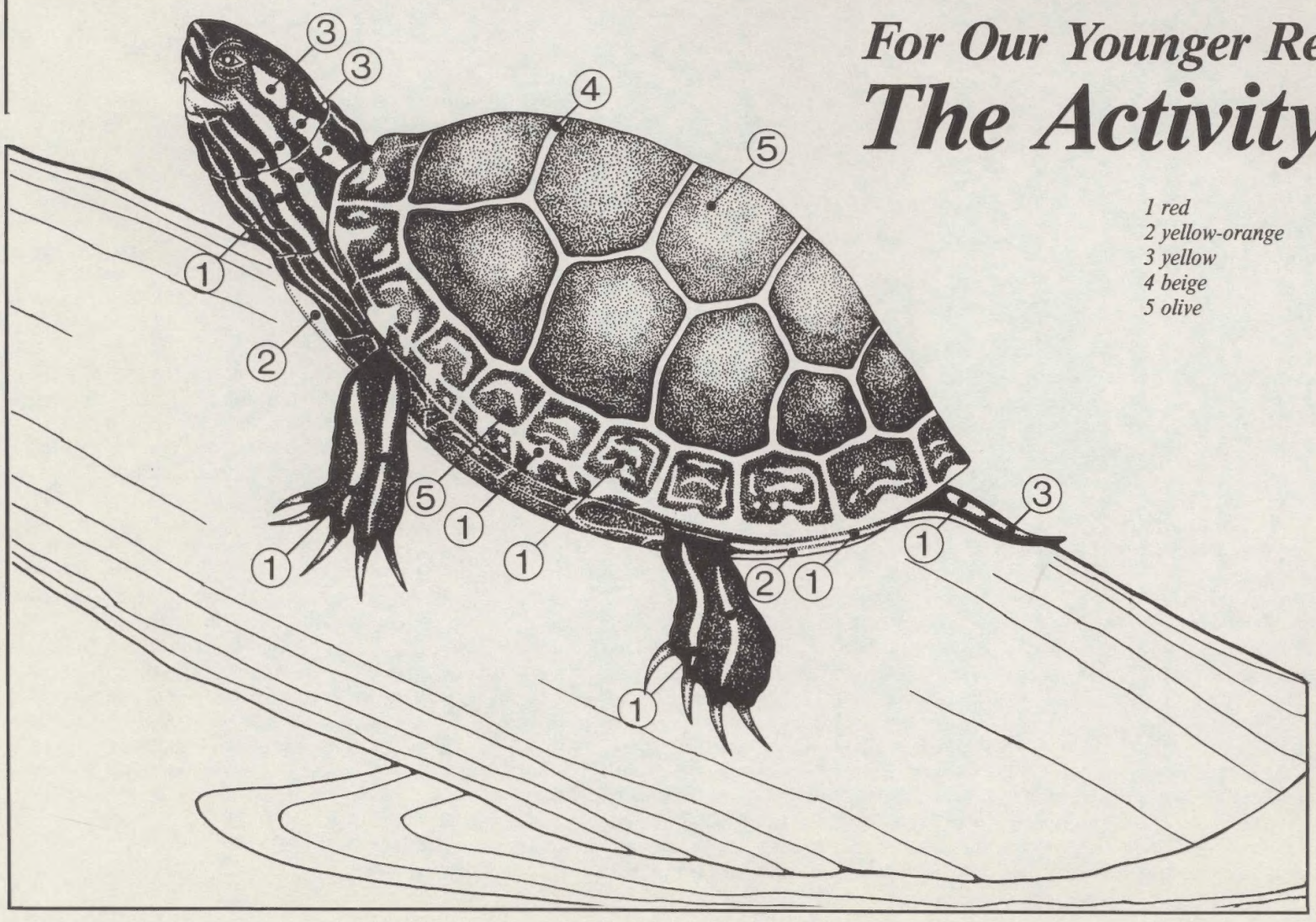
collections, which now include nearly 4000 carefully prepared skeletons from all vertebrate classes. This base of collections and expertise is why professionals from all Canadian provinces and territories and the northeastern United States, as well as individuals who have found bones while gardening or at the cottage, come to the ZIC for the identification of what they've found.

Unfortunately, there is a very real possibility that the Museum will no longer be able to offer the services of the Zooarchaeological Identification Centre to either the public or to specialists in other institutions. An acute shortage of person-years — the ability of the Museum to keep people on staff — has left many of our collections in danger. Should additional resources not be forthcoming, the Centre will be forced to close its doors at the end of March. But at least until then, our staff will be happy to help you. Specimens for identification may be left at the Information Desk of the Victoria Memorial Museum Building.

Steve Cumbaa
Zooarchaeological Identification Centre

For Our Younger Readers:

The Activity Corner



1 red
2 yellow-orange
3 yellow
4 beige
5 olive

Painted Turtles (*Chrysemys picta*) are the most common turtles in Canada: they can be found in all provinces except Newfoundland, which does not have any turtles. Painted Turtles are often seen sunning themselves on rocks and logs that stick out of ponds, marshes, rivers and lakes or along the shore. They will even sometimes pile on top of each other if there are only a few good places to lie on! Their heads, legs and tails have bright yellow or red stripes. There is sometimes red or yellow on the top part of the shell (the carapace) as well, but the colour of the bottom part (the plastron) depends on where in Canada Painted Turtles live. This drawing shows the Midland Painted Turtle, which lives in southern Ontario and Quebec. Colour it in and you will see why they are called "painted" turtles!

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PARIS Comes to the Museum

The title of this article does not refer to the city of lights, the city where Eiffel built his tower, the city of romance and the River Seine.

The PARIS of this article refers to a computer support system adopted by the National Museums of Canada's Canadian Heritage Information Network (CHIN), which has provided curators and research scientists in the NMNS with a powerful tool to manage their collections and to reduce the time spent on various curatorial and cataloguing tasks.

PARIS is an acronym for Pictorial and Artifact Retrieval Information System. It is a system that uses a natural language (French or English), often called "user friendly" since the commands and responses are given in everyday simple words or phrases. Operation of the system can be mastered in a very short period of time.

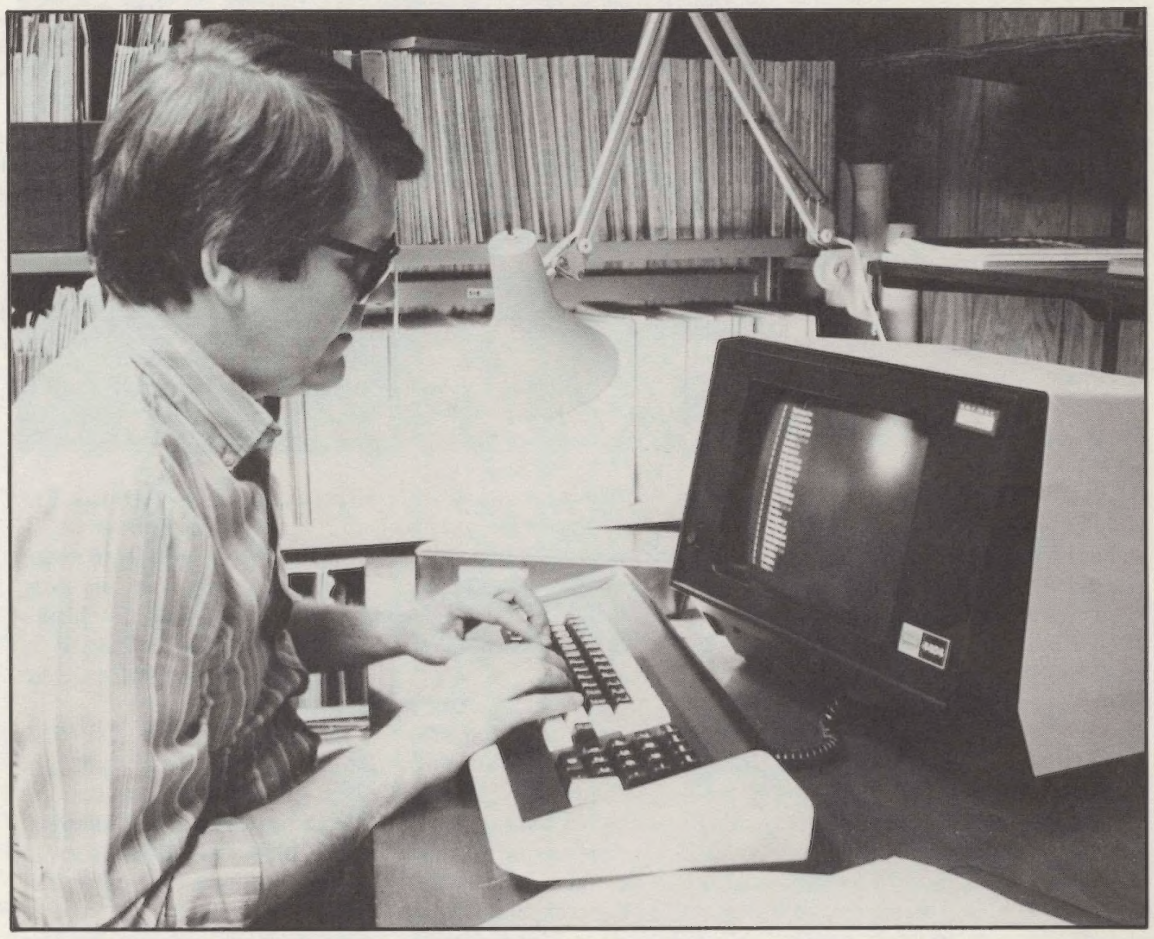
PARIS is an ideal, a dream come true, for Museum curators who need to catalogue, in several different ways, objects that are as varied as nature itself. However, input of data into the system ranges far beyond natural history, as it is currently used by all components of the National Museums of Canada and by several subscribing institutions across the country. Through a series of commands, PARIS will sort, edit, add, delete, print or provide any number or combinations of information a user may desire.

Since PARIS first came to the NMNS in May 1983, more than 400,000 specimens have been catalogued into the system, representing the collections of several disciplines, including mammals, birds, plants, minerals, zooarchaeological sites, fossil plants, worms, parasites, pollen and spores.

In addition to the physical equipment and the PARIS system itself, CHIN provides the professional support of programmers, consultants and data management personnel. Through a close working relationship with scientists and curators, the CHIN staff is able to provide answers to often confusing questions about the whys and wherefores of computer technology and, perhaps even more important, to provide documentation and reports for use by NMNS staff as needed for the daily operation of their research and for publication and display.

Prior to the arrival of the PARIS system, curators and scientists relied almost entirely on cumbersome catalogue pages and card index files to record information concerning their collections. Often, several different cataloguing and file systems, unique to a discipline and manageable by only one or two persons, were used to sort and document the vast array of natural history specimens. In truth, many of the details of these systems were left to memory or chance. Today however, the use of PARIS has provided a documentation system understood and available to not only the entire Museum staff, but also to the people of Canada throughout institutions across the country. Cataloguing and terminology are now standardized, leaving nothing to chance and providing quick and accurate information on Canada's natural heritage.

The future of PARIS in the NMNS looks even more promising. Eventually, videodisc applications will record visual as well as textual documentation about a specimen. More rapid data entry (and thus retrieval) through desktop personal computers will further enhance the usefulness and availability of the system. Some reference files are now available to the user and it is hoped they will be enlarged and improved over the next few years, which will allow access to library holdings, training programs, dictionaries, and gazetteers.



Dr. David M. Jarzen at the PARIS/CHIN terminal. Operation of the system can be mastered in a very short period of time.

The PARIS of this article may not be the city of lights, but to some it has provided the "romance" of high tech equipment brought to practical application for scientific research.

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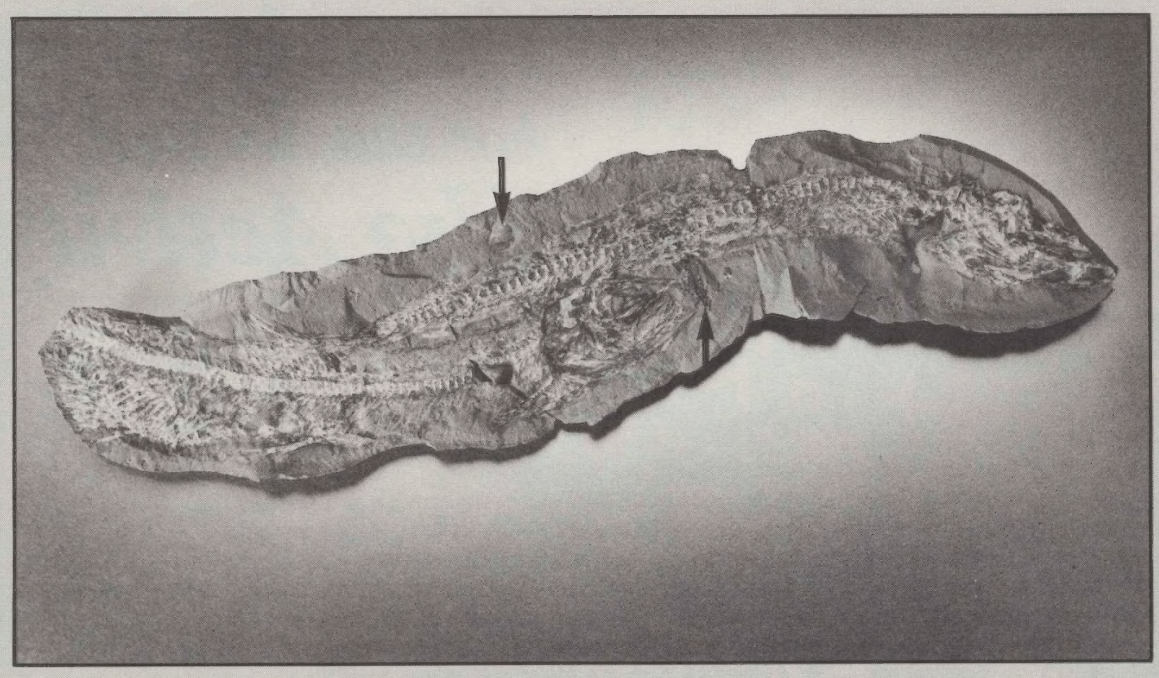
The Marvelous Fossils of Green Creek

Of all the fossil localities in Canada, none preserves a better record of life as it was about 10,000 years ago than Green Creek, located about 10 km east of Ottawa. When split, nodules exposed mainly by erosion of clay deposits along Green Creek and the nearby Ottawa River often reveal remains of animals and plants. So far, at least 15 species of vertebrates, 20 species of invertebrates, and 27 species of plants have been identified from nodules collected in the vicinity of Green Creek.

There is a good chance of reconstructing the environment near what is now Ottawa by a careful study of the habitat requirements of the species, and their relationships when they appear together in split nodules. Rarely, remains of plants, vertebrates and invertebrates are delicately preserved together: they indicate that several habitats coexisted in the region when the Champlain Sea was receding from it about 10,000 years ago.

The calcareous (containing much calcium carbonate) clay nodules, when split, sometimes reveal mirror images of animal and plant remains. Valves of sea shells such as *Macoma balthica* and the squarish, white *Hiatella arctica*, as well as fishes such as capelin are common. The delicacy of preservation is best shown by remains of tiny shrimp-like crustaceans, flying insects and bird feather impressions. At the other end of the scale are large, spectacular specimens such as the skull and forelimb of an American marten and a complete 24 cm-long skeleton of the longnose sucker, in which bones and scales are preserved intact. Most of the marine species described still survive in the Gulf of St. Lawrence — an area that was formerly at the eastern approaches to the Champlain Sea. Twigs, leaves, seeds and pollen of various plants occur in the nodules. They represent at least ten types of habitat ranging from moist hardwood forest to freshwater pond to brackish water to marine.



*Two skeletons of capelin (**Mallotus villosus**) preserved in a clay nodule from Green Creek. The upper arrow points to one of several small sea shells and the lower arrow to a May fly nymph lying near the mouth of the lower capelin. The nodule is 3 cm long.*

The Champlain Sea has an important bearing on the Green Creek fossils. It was a vast inland sea that formed somewhat earlier than 12,000 years ago when the last ice sheet retreated north of the St. Lawrence Lowland, allowing sea water from the Atlantic to flood southwestward along the depressed trough. The sea finally drained about 9800 years ago as the land slowly "rebounded" from the great weight of the ice sheet. The fossil-bearing nodules are often found projecting from the Champlain Sea clay or washed out along the shores of Green Creek or the Ottawa River. So the nodules are most readily collected during periods of low water following a heavy spring runoff.

The earliest record of collecting at the site is about 1845 when Sir Charles Lyell published on concretions containing capelin remains collected by Sir William Logan, first director of the Geological Survey of Canada. Major contributions to our knowledge of the fossils have been made by Sir J.W. Dawson, Dr. H.M. Ami and Professor D.P. Penhallow. Since 1966, the NMNS Paleobiology Division has had a program for studying the Champlain Sea and its environment, which involves collecting, detailed mapping of the sites, recording of fossil-bearing nodules found in place in the deposits, identification of specimens, and interpretation of results. Recently this project has received much help from an amateur collector, Andrew Milner, and NMNS scientists Drs. Don McAllister and Steve Cumbaa, who have identified many of the fish fossils. Despite 140 years of collecting, we are just becoming aware of how little we know about the past environment and method of preservation of the Green Creek fauna and flora!

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